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/SUMMARY/

ICE FORMATION AT HIGH SPEEDS

Lt Rudolf Urich

(Polish translation of a Russian article "The Falcons of Stalin" by Lt Col J. Massen)

Increased speeds and blind-flying equipment are freeing aviation from atmospheric dangers. However, ice formation in flight still remains one of the major problems.

Ice formation may occur when the plane finds itself in a cloud, fog, rain, or wet snow, i.e., when water wapor is present in amounts of 85-100 percent. The fact that modern planes are chiefly constructed of metal further increases this danger since there is an electrical potential set up between the metal and the atmosphere which aids condensation of water vapor. At sufficiently low temperatures this vapor forms an ice coating which at times can be jet continueters thick.

Calculations show that with a significant formation of ice, the weight of the plane increases by 10 percent and more. This in itself is not the greatest danger. The thick coating of ice on the wings has the effect of changing the aerodynamic properties of the plane, and this is the greatest

Regulations state that to avoid icing no plane should enter a cloud with a temperature of 0 to -15 degrees Centigrade This regulation does not specifically state the types of planes to which this refers but is general in nature.

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With an increase in plane speeds this problem is somewhat alleviated. Due to air friction there is a body of hot air which continually surrounds the plane. The temperature of this body of air varies with the velocity of the plane. In tests on V-2 rockets at speeds of 4,000 kilometers per hour, the rocket was heated to a red heat due to friction. The table below presents data on the increase in temperature at various air speeds.

Speed (km/hr)		Temperature Increase
100	and the second of the second second	0.38
200		1.5
300		3.4
400		6.0
500		9.4
700		18.6
800	and the control of the second	
1,000	er e	38. 0
1,500		85.0
-2,000		152.0
3,000		431.0
4,000		606.0

This table shows the speeds and resulting temperature by means of which danger from ice formation can be avoided.

At present the heating of the cabin and crew of a plane is one of the major problems. However, a new problem, that of cooling a plane flying at high speeds, has arisen.

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